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Zambelli

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[54] GAS ZOOM LENS ASSEMBLY

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[52] U.S. Cl. 350/419; 350/255

[58] Field of Search 350/419, 418, 255

[56] References Cited

U.S. PATENT DOCUMENTS

3,496,851 2/1970 Himmelsbach 350/419 X
 3,528,727 9/1970 Halliday 350/419 X
 4,331,388 5/1982 McCrobie et al. 350/419

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[57] ABSTRACT

A multi-element lens is enabled by varying the pressure of a gas contained within a central cavity by a piston/cylinder arrangement. During magnification changes, the same mechanism used to change the lens position between an object and image plane is utilized to simultaneously vary the pressure within the lens cavity. The pressure change causes a change in the refractive index of the gas, thereby adjusting the focal length of the lens to the value required by the magnification change.

3 Claims, 3 Drawing Figures

